Treatment of Acute Pneumonia.

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TREATMENT OF ACUTE PNEUMONIA.

During the last five years I have been engaged in making a collective investigation on the influence of cold applied to the chest in the treatment of acute pneumonia, and so far have succeeded in gathering two hundred and ninety-nine cases of this kind from the experience of my fellow practitioners and from my own. In studying and analyzing these cases I have naturally formed convictions and drawn conclusions concerning the utility of the treatment which was employed, and, although these may not be entirely correct, I express the hope that they may be of sufficient practical interest to justify me in bringing them before you this evening for a free and full discussion.

In the first place, let us seriously consider the pathological condition with which we have to deal when we are confronted by a case of acute pneumonia, for over and above the picture which this gives us of the mechanism of the affection, it will also lead us to adopt correct principles of treatment. Under the term acute pneumonia I include both croupous and catarrhal varieties, though, as is well known, these two forms differ pathologically. In the croupous variety the pulmonary capillaries are enormously distended and engorged with blood. There is partial or complete stasis in these vessels, and the serum of the blood exudes through their walls and accumulates in and finally fills the air cells of a whole lobe, for which reason, as is well known, it is also called lobar pneumonia. The next step in the morbid process is a fatty decomposition and expectoration or absorption of this accumulated material, and after this the lungs return to perfect health. In the catarrhal form of acute pneumonia the process is different. The blood-vessels are also distended and engorged with blood, but in place of a serous exudation into the air cells, these become partially or completely filled with catarrhal material derived chiefly from their epithelium. The whole process seems to be less active than that in the croupous variety, but the morbid products may also undergo fatty degeneration, although there is danger of cheesy metamorphosis if the affection is too prolonged. Now, whatever may be the cause of the distention and engorgement of the pulmonary capillaries in both forms, and especially in the croupous variety, it is this *blood-fulness* of the lung which must be constantly borne in mind as one of the salient points in the treatment of this disease.

This leads to a consideration of the various tendencies towards death in

pneumonia, and in doing this I shall first take up the inflammatory process in the lung itself. This being the most superficial manifestation of the disease, it is very often taken for granted that its area is an indication of the seriousness or insignificance of the affection. This holds true as a rule, but must not always be depended on, for occasionally cases are met with in which very few abnormal physical signs are discoverable, so far as infiltration is concerned, and yet the symptoms are of the gravest character and, therefore, out of all proportion to the size of the area which is implicated. On the other hand, cases are found in which several lobes are involved, while the symptoms are unusually mild, and the patients make a rapid recovery. A frank and limited localization of the inflammatory process in the lung is not one of the most unwelcome features of pneumonia, yet efforts must always be made towards allaying and circumventing it.

One of the most serious of these tendencies is respiratory failure, which seems to be dependent on an impaired and defective nerve supply of the lungs in particular, and on a profound depression of the nervous system in general. It is a symptom which is frequently associated with latent, senile, and alcoholic pneumonia. As a rule, a low temperature is one of its characteristics. The respiration is short and frequent. There is a want of respiratory movement in the chest walls, and the abdominal breathing is exaggerated. Each breath is a labored one, and almost seems as though it were the last the patient could take. Such patients have assured me that they feel as if the only breathing surface left to them were centred in the upper and middle portion of the chest. Auscultation often reveals only a small amount of physical disintegration, and this generally at the base of the chest, although the respiratory murmur is markedly diminished in volume, if not over the whole chest, at least in spots. There is orthopnea, but cyanosis is not so marked as it is when the heart becomes much implicated. Another prominent symptom in this tendency is pain or distress in the epigastric region, which, in all probability, comes from the diaphragm, and is evidence that this organ, in endeavoring to establish compensation for the loss of pulmonary movement, is being overworked.

Another tendency towards death comes through paralysis of the heart. This is partly due to a want of cardiac innervation, and partly to obstruction of the pulmonary circulation. It is very readily seen that stasis of the blood in the lungs, such as is found in acute pneumonia, will at once interfere with the free flow of blood through the right side of the heart and lead to distention of the right ventricle. It becomes a question, therefore, of the greatest importance, whether this tendency is best overcome by stimulating the heart's action, or by removing the obstruction in the lungs, to which I shall revert further on.

The fourth tendency towards death, of which I shall speak, is fever with its consequences. According to Ott, Aronsohn and Sachs, Eulenberg, and Landois, fever is always evidence that the function of heat coör-

dination is disordered and that it has lost its power of restraining excessive heat production, or heat dissipation, or both. The same observers have shown that this power of heat regulation resides in the six heat centres, two of which are in the cortex and four at the base of the brain, and that electric or mechanical irritation of these centres produces a temperature-rise lasting for hours. Fever is, therefore, essentially a neurosis, and one of its dangers lies in the well-known fact that it is a great tissue-waster. Besides this, fever also generates toxins in the body which, according to the experiments of Vincent, are capable of causing convulsions, stupor, and death in guinea-pigs, sparrows, and frogs.

Now, the therapeutic indications which may be drawn from the foregoing considerations are as follows: (1) *Reduction of the volume of blood in the lungs.* This relieves the distention of the pulmonary capillaries, checks the serous exudation and catarrhal infiltration, abates the stasis in the pulmonary blood-vessels, restores the cardio-pulmonic circulation, and relieves the strain on the right side of the heart. (2) *Reduction of fever.* This allays the irritability of the nervous system, diminishes bodily waste, and lessens the danger of toxin formation in the blood. (3) *Support of the nervous system* in general, and the pulmonary nerve supply in particular. (4) *Support of the heart's function.* (5) *Nourishment of the patient.*

Now, what is the agent or agents that will meet most of these indications in the best possible way? I believe we possess this agent in ice, or ice-cold water applied in rubber bags locally to the chest and directly over the seat of inflammation; and this for the following physiological reasons: Cold contracts blood-vessels, reduces fever, stimulates the whole nervous system, and supports the action of the heart. Practically, as I have witnessed time and again, the ice will check extension of the inflammatory process, promote resolution, disperse the products of exudation, reduce the fever, diminish the cardiac and respiratory frequency, tone up the heart, strengthen the pulse, alleviate difficult breathing, abate pain in the chest, and give general comfort to the patient.

The number of ice-bags which are to be applied in any case depends on the degree of fever which is present, and on the size of the area which is inflamed. If the fever is not very high and the area is small, one or two will answer. If the fever is high and the involved area large, almost any number may be applied, always bearing in mind that the head should have one or two bags applied constantly. On one of the worst patients I had I applied nine, which covered the whole chest, sides and front, and two to the head. The length of time during which they are applied also depends somewhat on the range of fever. If the temperature falls near the normal then I think it is wise to remove some of the ice-bags, but think it is best not to remove them all, even though the temperature is down, unless the crisis is at hand, because if all the bags are removed before the proper

time, the temperature will rise again, and is brought down with greater difficulty the second than the first time.

Supposing that in a very grave case cold had been applied after the manner here prescribed, and had failed to modify the difficult breathing, the distress in the chest, the cyanosis, etc., what could be done to reinforce the influence of cold? There is no question that the old and almost forgotten art of venesection will give more assistance than anything else in such an emergency, and should be resorted to without hesitation. Its effects under these conditions are the same as those which are sought to be brought about by cold—viz., relief to the over-distended cardio-pulmonary circulation.

What is to be said of the drug treatment in pneumonia? In the face of the present trend to regard pneumonia as a self-limited disease, and that hence all the practitioner has to do is to sit idly by and admire the storm while it is passing over, it is somewhat in a spirit of diffidence that one suggests the feasibility of the use of drugs or of anything else in this disease. In spite of this opinion, however, I have a feeling, which is born of experience, that drugs are invaluable here, and that one of the best of these is *strychnine*. This drug, with its stimulating action on the nervous system in general and on the respiratory nerve supply in particular, is especially well adapted for use in this disease, as it is in fact in all diseases of the pulmonary organs. Over and above this it is the equal of digitalis in enhancing the function of the heart, and in this manner tends to overcome some of the most serious tendencies to death in this disease. To get the best action of strychnine it must be given for tangible effects, *i. e.*, in doses large enough to approach the line of its toxic action, and for this reason it is useless when given in small doses. In the adult it is best to begin with a dose of $\frac{1}{30}$ of a grain four times a day, and reinforce this with a hypodermic dose of $\frac{1}{20}$ of a grain morning and evening. This amount can be increased, and very liberally, too, if the case is one of alcoholic or latent pneumonia. Another valuable drug is *digitalis*. With the very large doses of this agent which are prescribed by some authorities I have had no experience, but always give it in dessertspoonful doses of the infusion or from ten to fifteen drops of the tincture every four hours, with a view of obtaining its tonic influence on the heart-muscle. *Capsicum* is also of great utility. It is one of our most effective diffusible stimulants, and is of especial advantage in that stage of pneumonia which is characterized by a low muttering delirium, comatose tendency, picking at the bedclothes, etc., and which is very frequently associated with a dry and sometimes black crusty tongue. It is to be given in doses of from ten drops to a teaspoonful of the tincture in water every three or four hours. I have given a teaspoonful of tincture of capsicum every hour with the best results in cases of low alcoholic pneumonia. *Morphine* given hypodermically at night in quarter-grain doses will secure sleep and add to the comfort of the patient. Sleep is very

important in this disease, and a ten-grain suppository of *asafetida* at bed-time will materially aid the hypnotic effects of morphine. *Oxygen* given by inhalation is of immense service in cases of great dyspnea and cyanosis. Of course, it is only of temporary use, but during that time it assists greatly in bridging over the most critical period of the disease, and so saves the patient's life. If the dyspnea is marked it must be given more or less constantly. The *salicylate of cinchonidia* and the *salicylate of soda* are especially useful in the treatment of pleuro-pneumonia, or in grip-pneumonia, or when the pneumonia is complicated with painful joints, or if the disease occurs in a patient with a rheumatic history. Whenever these manifestations occur it will always be of advantage not to overlook these most important agents.

The question of food also concerns us greatly in the management of this disease. The food should be of the most nourishing character, concentrated in bulk, and of easy digestion. Such food we find in freshly expressed beef juice, of which two ounces, properly seasoned, should be given alternately, every two hours, with a glass of milk containing a tablespoonful of whiskey or brandy. If the stomach is rebellious the beef juice and milk and whiskey may be given by the rectum.

Now a few words more in regard to the ice-cold treatment of pneumonia. If it were not for the belief which I entertain, that it offers the fairest hope for solving the problem how to treat pneumonia most successfully, I would not be before you with this topic to-night. I do not offer this measure as a panacea, but I have the conviction that the treatment of pneumonia as ordinarily carried out, or exclusively of cold applied in some form, is worse than useless. I must confess that this is strong language to use, but when we look about and see that the natural tendency to recovery in this disease holds good in about eighty-five out of every hundred cases, and then find that our hospital statistics, with a few exceptions, give us a death-rate ranging from fifteen to thirty per cent., I think I am perhaps justified in employing it. I think this view is also endorsed by the results obtained in the cases which comprise my collection. Thus, in the 299 cases so far gathered there were ten deaths, giving a total death-rate of 3.35 per cent. Over and above the superior results which are given by the ice treatment in these cases is the fact that they were not secured by a single individual only, but by as many as fifty independent observers, among whom are a number who have treated a score of cases without a single death. This of itself speaks volumes in favor of the treatment, for it shows that the personal equation of the practitioners cannot enter very largely into the question of its success.

Now, what of the future of the treatment of acute pneumonia? Is there reason for believing that the death-rate of this disease may be diminished still further on the lines here indicated? I believe that this is possible. Of several things I am certain. One of these is that we have the

course of pneumonia under control. The other is that the idea that pneumonia is a self-limited disease and pursues the even tenor of its way in spite of all medication is a delusion and a myth of the most pernicious type. It is a sprag in the wheel of therapeutic advancement. It is on a par with and belongs to the dogmatism of twenty-five years ago which asserted that the whole treatment of acute rheumatism could be summed up in "three weeks and plenty of woollen blankets." Salicine and the salicylates have undeceived us and taught us better. Thanks to them, this disease consumes a less number of hours now than it did days then, and we approach it with the utmost confidence, but not with any greater degree of assurance than, I believe, we may encounter acute pneumonia at the present day.